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Several Crustaceans Termed 'Underutilized'

Several crustaceans are high on the list of preferred food items. In the United States the list includes the pink, white and brown shrimp, American and spiny lobsters, Alaskan king crab, Dungeness crabs and blue crabs. The annual catch of each is valued in excess of $5 million.

Numerous other crustaceans, each with an annual catch value in excess of $100 thousand, are of secondary importance and may be considered as "underutilized" species, according to W. A. Van Engel, head of the Department of Crustaceology at the Virginia Institute of Marine Science. Pandalid shrimp, other South Atlantic and Gulf shrimp, stone crab, rock crab, jonah crab, red crab and snow crab are listed in this category.

Speaking at Fish Expo 1974 held recently in Norfolk, Van Engel defined an underutilized species as "a species that lacks one or more desirable qualities necessary for successful marketing. To be successfully marketed, an animal has to have such qualities as large and steady (predictable) abundance; availability to fishing gear; ease of handling, processing and marketing after capture; and consumer acceptance."

Van Engel pointed out that in several instances, species are underutilized solely because of the lack of adequate fishing gear, inadequate processing technology or a combination of both.

"Some of the crustaceans found in the Chesapeake Bay and the adjacent continental shelf, slope and canyons fit my definition of underutilized species and I think they could stand added exploitation," Van Engel said.

The oceanic region between Cape Cod, Massachusetts and Cape Hatteras, North Carolina is known as the Mid-Atlantic Bight or the Virginian Sea. Within this region, the section between Cape Henlopen, Delaware and Cape Hatteras is called the Chesapeake Bight, approximately 171 nautical miles in length.

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VIMS Hosts Conference On Bay Management Plan

Citizen's Program for the Chesapeake Bay (CPCB), a group of citizens and organizations from Virginia and Maryland dedicated to developing a balanced, comprehensive management plan for the Bay, held their second annual meeting January 6 and 7 in Newport News.

The conference, hosted by the Virginia Institute of Marine Science, focused on the strengths and weaknesses of a Bay-wide River Basin Commission and the compatibility of such a commission with existing state Coastal Zone Management efforts.

According to Ron Schmied, VIMS' advisory specialist in Coastal Zone Management, River Basin Commissions are usually created in an effort to more

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"For convenience in discussion, we designate the continental shelf as that section from the shoreline to the 100 fathom curve," said Van Engel. "The continental slope begins at the 100 fathom contour. The edge of the shelf is about 71 nautical miles to the east of Ocean City, Maryland, about 65 nautical miles east of Chesapeake Bay and about 25 nautical miles east of Cape Hatteras."

Four canyons in Chesapeake Bight -- Wilmington, Baltimore, Washington and Norfolk -- cut the edge of the shelf and appear to sustain concentrations of fishes and crustaceans.

Van Engel said that approximately 90 species of crabs, shrimp and shrimp-like animals are presently known to exist within the shelf, slope and canyons and overlying waters of the Chesapeake Bight. Many rare species and only a few abundant ones are among this number.

"Sixty percent of the species are found between the shoreline and 10 fathoms, 70 percent are within the first 50 fathoms and 92 percent are found between the shore and 100 fathoms," Van Engel said. "Many of the animals are of small body size. They are important links in the food chain, transferring energy from the lower to higher or larger animal forms."

About 12 species attain a large size, but only four are large and abundant enough to be considered commercially valuable. The four, each underutilized in the Chesapeake Bight region, are the American lobster (Homarus americanus), the jonah crab (Cancer borealis), the rock crab (Cancer irroratus) and the red crab (Geryon quinquedens).

Within Chesapeake Bay there are approximately 28 species of crabs, shrimp and shrimp-like animals. About nine species attain a large size, but only two, the blue crab (Callinectes sapidus) and the rock crab (Cancer irroratus), are large and abundant enough to be considered commercially valuable.

In his presentation, Van Engel discussed the potential of these five species as exploitable resources:

Blue Crab

The hardshelled stage of the blue crab is heavily exploited in Chesapeake Bay. Average annual landings of 70 million pounds from the bay represent about one-half of the United States production of blue crabs, but the softshelled stage must be considered underexploited, not only in the Chesapeake Bay area but also along the southeast and gulf coasts.

Soft and peeler crabs constitute only 3.5% of the total bay catch of crabs. Yet this surprisingly small percentage returns 20% of the crab fisherman's income.

A blue crab is potentially susceptible to capture as a soft or peeler crab during the three to four molts it completes during the three months prior to reaching the five-inch legal catch width. Methods of capture and of holding crabs until they shed are not yet good enough to increase production. In the southeast and gulf coast states where effort is minimal, production of soft crabs is only 10% of the United States total.

Rock Crab

Large quantities of rock crabs are present in the Chesapeake Bay from November through April and are easily captured by dredges. A crude estimate of

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catch would be 500 to 1,000 crabs per hour dredging, or about 5,000 to 10,000 pounds of rock crabs a day. Yet no commercial fishery for hard rock crabs exists because of competition from the more highly prized blue crab fishery.

Since most of the rock crab meat is removed from the relatively small legs and claws, pounds of crab meat picked by a worker in one day is likely to be far less than can be obtained from blue crabs. Development of a suitable mechanical picker is needed.

Peelers make up about three-fourths of the Chesapeake Bay rock crab catch in December and early January. Crabs shed in late December and during January. Opportunity is promising for developing a winter soft rock crab industry. About 750 pounds or approximately 190 dozen soft crabs were produced in the winter of 1973-74.

In other months of the year rock crabs are scarce within the Chesapeake Bay, but are common offshore and can be caught in seabass and lobster pots. Temperature, depth and bottom type may affect distribution of the rock crab. Most crabs have been caught on silty bottoms, at depths less than 35 fathoms and in the 46 to 57°F range.

Jonah Crab

Closely related, but of a larger size than the rock crab, is the jonah crab. The meat of the claws and legs is especially prized. Jonah crabs are found offshore in deeper waters than rock crabs and in areas where American lobsters are present. But because of competition from the more highly valued lobster, catches of jonah crabs are usually discarded until near the last day of fishing when they may be retained to augment the lobster catch. In 1973, 76,000 pounds valued at over $6,000 were landed.

Offshore stocks of jonah crabs are moderately large, according to current estimates. Catches of crabs in lobster pots vary with geographic area, although the reason is not known. In one area the catch ranged up to 17.6 crabs per pot, with an average catch of 6.8 crabs. The potential catch there was about 12,000 crabs for an eight-day cruise. In a second area the maximum catch was 2.8 crabs per pot, with an average catch of 1.1 crabs. Unless a better means is found to extract meat from these crabs, it is uneconomical to land large quantities.

American Lobster

There is a small though active pot fishery for the American lobster at the edge of the shelf off Virginia. To date, landings vary in direct proportion to the number of pots and also vary seasonally. The quality of pot-caught lobsters is high. Interestingly, the catch contains very few lobsters smaller than the legal 3-3/16 inch carapace length.

No firm estimate of the abundance of lobsters has been made, but it is apparent that landings of a million pounds a year can be realized. The chief difficulty in effecting such a catch is maintainance of large strings of pots.

Red Crab

The red crab resource at the edge of the shelf, in the canyons and on the slope off Virginia is of uncertain magnitude. Trawl nets and pots have caught red crabs at 150 to over 800 fathoms. Crabs apparently are more abundant on the slope than in the canyons. The most productive zone found in VIMS' investigations has been 145 to 280 fathoms, deeper than where lobsters and jonah crabs are most abundant. The quality of the catch by pots has been superior to that obtained by trawl nets.

The chief difficulties in exploiting the red crab resource lie in maintaining a large string of pots and in establishing a nearby onshore processing plant.

Fisheries Zone Hearings Set For March

Open hearings on the bills to extend the exclusive fisheries zone off the United States coast and similar legislation on the subject will be held before the House Subcommittee on Fisheries and Wildlife Conservation and the Environment in March.

The hearings have been scheduled for the week of March 10 through March 14, beginning at 10 a.m. daily in Room 1334, Longworth House Office Building, Washington, D.C.

Representatives of the Departments of Commerce, State, Transportation, and Defense and public witnesses will be heard during this period. Those wishing to be on the witness list should write the Committee on Merchant Marine and Fisheries at the above address, or call Mr. Everett (202/225-4047) or Ms. Wescott (202/225-6785). Those unable to attend the hearings may submit comments in writing to Hon. Robert L. Leggett, Chairman, Subcommittee on Fisheries and Wildlife Conservation and the Environment, Room 1334, Longworth House Office Building, Washington, D.C. 20515.

The hearings are a continuation of the hearings held in the 93rd Congress on similar bills, during which time 10 days of field hearings were held, beginning in Portland, Maine on May 10, 1974, and ending in San Pedro, California on October 18, 1974. Rep. Thomas N. Downing of Virginia presided over the hearing held July 12, 1974 in Hampton. Both Downing and Rep. William G. Whitehurst favor passage of legislation related to the exclusive fisheries zone.

The Emergency Marine Fisheries Protection Act is intended to provide the U.S. with fishery management jurisdiction over fish within a 200 nautical mile zone and over anadromous species of fish beyond the zone in order to manage and conserve such fish.

This jurisdiction is being asserted because a number of stocks of fish off the U.S. coast are depleted or threatened with depletion primarily because of foreign fishing efforts.

In addition to the problems of overfishing, the principal mechanism for managing and conserving these fish has been international agreements that have largely failed in their purpose.

The bill (H.R. 200) to extend on an interim basis the jurisdiction of the United States over certain ocean areas and fish is in response to the danger to coastal and anadromous fishes because of overfishing. By its terms it will automatically terminate at such time as general international agreement on fishery jurisdiction is achieved and a universal treaty on the question comes into force or is provisionally applied.

The bill also would initiate a national marine fisheries management effort by the creation of a Fisheries Management Council which would prepare and adopt a national marine fisheries plan to be approved by Congress. The plan would essentially address the question of designating appropriate institutional arrangements for fishery management.

The Council would also examine and make recommendations on possible techniques for effectively regulating and managing marine fishes.

Section 4 asserts fishery management jurisdiction out to 200 nautical miles and over anadromous species of fish throughout their migratory range, except to the extent such fish are found in another nation's territorial waters or contiguous fishery zone. Specific exception is made for highly migratory species such as tuna which the bill declares would more appropriately be managed by international arrangements.

If such arrangements on any stocks of highly migratory species do not exist,

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then U.S. jurisdiction in the 200-mile zone would apply to such stocks as well.

H.R. 200 would not eliminate all foreign fishing within the 200 mile contiguous fishery zone or the harvesting of migratory species. Instead it is the intention of the bill to direct the Department of State to begin phasing out such treaties as the U.S. prepares itself to take over the management effort.

The maximum amount of foreign fishing to be allowed after all treaties are phased out is specified in Section 5. After a foreign nation has proved that it has traditional fishing rights, it is to be allowed only that portion of any particular stock which cannot be harvested by United States citizens. This essentially is the overall limit of foreign fishing to be allowed after treaty rights have been phased out.

NOAA Offers Fellowships To Disadvantaged Students

A number of talented, but disadvantaged, high school seniors will be appointed by the National Oceanic and Atmospheric Administration (NOAA) as Junior Fellows at various locations across the United States this year.

Positions will be in the National Weather Service, National Ocean Survey, National Environmental Satellite Service, Environmental Data Service, and Environmental Research Laboratories.

To be eligible, candidates must be high school seniors in the top 10 percent of their graduating class; accepted by (or an applicant to) a four-year college; and in need of financial assistance to continue their education.

Interested students should apply to their principal or counselor, who make nominations for the program.

Mary Washington College Schedules Marine Biology Course

The Office of Admissions at Mary Washington College in Fredericksburg, Va. is accepting applications for a six-week summer course in marine biology.

Cross Rip Camp in Deltaville, Va. will be used as home base for the special course which will run from May 26 through July 5, 1975. The course is a study of marine organisms with particular stress on their ecology, phylogeny and behavior. Dr. William Pinschmidt and Dr. Anna Hoye, both professors of biology at Mary Washington College, will teach the course.

The classroom-laboratory-library at Cross Rip is equipped for microscopic study, chemical analysis, gross dissection and observation of living materials in coordination with audio-visual techniques. Boats of various sizes, including a specially equipped 22 foot Aqua-Sport, are used for both class study and independent projects.

Students who wish to reserve a place in the course should file an application with the Director of Admissions, Mary Washington College, Fredericksburg, Virginia 22401. Since enrollment is limited, early registration is advised.

Students will be notified of their acceptance within two weeks after receipt of their applications. Students applying after the class is filled will be placed on a waiting list and informed of enrollment as vacancies occur.

School teachers may apply credit earned towards certification renewal with the approval of their respective superintendants.

College students and other interested persons may contact the Office of Admissions for further information.

A VIMS educational service

marine mailbag

Q. I would like to request some information on the origin, history and the future of sea farming.

M.W.
Hampton, Virginia

A. Sea farming, or aquaculture, may have its origins as long ago as the ancient civilizations of the Near East, but it has been established that oyster culture was practiced in ancient Rome and Gaul. It still accounts for a small, though growing, proportion of the world's aquatic food harvest. Most of this farming is done in fresh or brackish waters since the culture of marine organisms (mariculture) is practiced commercially with only a few species.

Aquaculture is broadly defined as any process in which organisms are manipulated in at least one way before harvest, but the more intensive operations consist of culture under controlled conditions using principles of agriculture and animal husbandry. Traditional oyster farming in Virginia is an example of a low intensity method; more intensive techniques have recently been developed in which oysters are spawned and raised in the laboratory.

Important species under cultivation in the United States are trout, catfish, goldfish, bait minnows, and various tropical fishes for the aquarium trade. Carp, although not popular in this country, probably has been cultured for a longer time than any other fish. It is believed that carp may have been raised in China for about 4,000 years, and an account of spawning captive carp was written in 475 B.C.

Although aquaculture has been promoted as a possible solution to the ever-increasing world deficit of protein, current efforts are concentrated on production of luxury foods. The aquaculture industry is expanding around the world, but this will contribute very little to feeding our hungry millions, at least for the near future.

For more information see:

Bardach, J.E., J.H. Ryther, and W.O. McLarney. 1972. Aquaculture. Wiley-Interscience, New York 868 p.

Q. As a biology teacher, I'd like to know if you offer a marine science course that would help me in making marine study a part of my high school program.

E.V.P.
Tangier, Virginia

A. VIMS is currently planning a three-week program, "Introduction to the Coastal Zone Environment", tentatively scheduled to begin on July 7, 1975. Further information will be published in the Marine Resource Information Bulletin.

Holding Tank Deadline Extended

Board members of the State Water Control Board voted on January 25, 1975 to push back for one year the implementation deadline for installing waste retention systems on boats with marine toilets.

New deadline for compliance with Regulation 5 - Control of Pollution from Boats is March 7, 1976.

Meat Quality Index

Improvement Noted In York River Oysters

Meat quality in the James River was average at most stations and about the same as the values recorded for December. The exception was at Horse Head in the lower river where quality was below average -- a sharp decline over the previous month. Quality in the lower river in 1975 was lower than it was a year ago.

In the York River quality was average to above average and had increased over the previous month. This increase is not typical of winter conditions and the reason is not apparent. Marine biologists say the increase may have been associated with the mild winter conditions but the evidence is not conclusive.

In the Rappahannock River quality was above average at all stations with the highest indices occurring at Urbanna and Bowlers Rock. In general levels were about the same or lower than they were a month ago.

KEY TO INDEX NUMBER

4.0 TO 5.9	BELOW AVERAGE
6.0 TO 7.5	AVERAGE
7.6 AND UP	ABOVE AVERAGE

	November		December		January	
JAMES RIVER	1973	1974	1973	1974	1974	1975
White Shoals	5.0	-	6.1	6.0	6.8	6.1
Wreck Shoals						
shallow	6.0	-	6.0	5.9	5.9	6.6
deep	5.7	-	5.2	6.7	5.3	6.4
Point of Shoals	7.5	-	7.6	6.6	7.5	6.6
Horse Head	7.5	-	7.3	4.3	7.0	4.2
YORK RIVER						
Green Rock	6.0	7.4	-	-	-	7.1
Pages Rock	6.9	8.0	-	-	6.0	7.9
Aberdeen Rock	6.5	8.0	-	-	6.6	7.6
Bells Rock	7.1	-	-	-	6.5	8.1
RAPPAHANNOCK RIVER						
Urbanna	10.3	-	10.9	10.8	11.9	11.3
Smokey Point						
shallow	10.2	-	10.8	9.7	10.0	9.6
deep	10.4	-	10.4	8.3	9.1	8.0
Morattico	10.1	-	9.8	9.8	10.5	9.1
Bowlers Rock	10.9	-	12.7	10.9	12.4	10.3

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effectively manage water and land resource units which extend into more than one state's jurisdictional area. If a RBC were created to manage the Chesapeake Bay, its members probably would include representatives of Virginia, Maryland, Washington D.C. and associated federal agencies. The initiative for establishing such a commission must come from the states.

"It was generally agreed that while a Bay-wide Commission is not particularly feasible at this time, it has a great potential for future use," Schmied said.

Conference speakers included Warren Fairchild, director of the United States Water Resources Council, James Douglas, commissioner of the Virginia Marine Resources Commission, Cranston Morgan, member of the Board of Directors of the Shellfish Institute of North America, and several representatives of the Virginia and Maryland Coastal Zone Management programs.

The CPCB, organized in 1971, has no delegated authority to develop or implement a management plan for the Chesapeake Bay, but is working to aid and motivate those who do. In order to achieve this goal, the Citizen's Program intends to:

- Provide a neutral forum for constructive dialogue between all parties interested in the Bay,
- Serve as a catalyst to distill points of view agreed upon by those parties, and from this,
- Develop a positive program of action for management of the Bay's resources for the best public use.

Most importantly, the Citizen's Program hopes to generate increased citizen involvement and understanding of the issues that are and will be critical to the continued beneficial use of the resources of the Chesapeake Bay.

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